

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Original) Apparatus for determining *in situ* a reflective characteristic of an area of a surface of an article being processed, comprising:
 - a machine component having a surface adapted to contact said article surface,
 - a window forming a portion of said component surface,
 - at least one source of optical radiation provided on the machine component on a side of the window opposite to the article contacting surface,
 - at least one source of optical radiation provided on the machine component on a side of the window opposite to the article contacting surface,
 - an optical radiation spreading element carried by the machine component between the window and said at least one source of optical radiation, said element spreading light from said at least one source of optical radiation through the window over an angle of 45 degrees or more,
 - collection optics carried by the machine component in a position to gather optical radiation passing through said window after reflection by the article area,
 - a photo-detector receiving optical radiation from the collection optics to generate an electrical signal related thereto, and
 - a processor utilizing the electrical signal to determine the reflective characteristic of the article area.

2. (Original) The apparatus of claim 1, wherein the collection optics is characterized by gathering optical radiation through said window over an angle of 45 degrees or more.

3. (Original) The apparatus of claim 1, wherein the collection optics is characterized by gathering optical radiation through said window over an angle of 15 degrees or less.

4. (Original) The apparatus of claim 3, wherein the optical spreading element is characterized by spreading light through the window over an angle of 80 degrees or more.

5. (Original) The apparatus of claim 1, wherein the collection optics includes a first light pipe that extends through the spreading element with an end facing the window, and wherein the apparatus further includes a second light pipe having an end positioned between said at least one source of optical radiation and the spreading element to obtain optical radiation from said at least one source of optical radiation.

6. (Original) The apparatus of claim 5, wherein the article contacting surface of the component is planar and has a back surface defining a thickness of the element therebetween, and wherein all of the window, at least one source of optical radiation the spreading element, the second optical radiation spreading

element, the first light pipe end, and the second light pipe end are positioned in a compartment formed in the component between its said article contacting and back surfaces.

7. (Original) The apparatus of claim 5, additionally comprising a second optical radiation spreading element carried by the component between the window and said at least one source of optical radiation in a position to direct optical radiation from said at least one source of optical radiation into the second light pipe end.

8. (Original) The apparatus of claim 6, wherein an electronic unit is attached to said machine component that includes amplifiers for each of the first and second electrical signals, an analog-to-digital converting circuit, and a processor, an output of the processor providing data of the article area reflective characteristic being determined.

9. (Original) The apparatus of any one of the claims 1-8, wherein the component is part of a chemical-mechanical-polishing machine that is given motion while processing the article area.

10. (Original) The apparatus of claim 9, wherein the component is a platen with a polishing pad as its said surface adapted to be contacted by said article.

11. (Original) The apparatus of claim 9, wherein the processor is characterized by providing an indication of an emissivity of the article surface area.

12. (Original) The apparatus of any one of claims 1-4, wherein at least two sources of optical radiation are provided at different optical wavelengths, the photo-detector receives optical radiation from the collection optics in said different optical wavelengths, and the processor utilizes signals from both of the optical wavelengths to calculate the article surface area reflective characteristic.

13. (Original) The apparatus of claim 12, additionally comprising circuits driving said at least two sources of optical radiation with different modulating frequencies, and electrical bandpass filters receiving the photo-detector signal to distinguish components modulated at said modulating frequencies.

14. (Original) The apparatus of claim 12, wherein the surface area reflective characteristic calculated by the processor is an indication of an emissivity of the article surface area.

15. (Original) The apparatus of claim 1, wherein said at least one sources of optical radiation includes a plurality of radiation sources positioned across a reflective inside surface of a hemispherically shaped shell that opens onto said optical radiation spreading element.

Claims 16-56 (Canceled)